Rainfall analysis for crop planning under rainfed condition at Mirzapur district in Vindhya plateau of Indo-Gangetic Plain

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ABSTRACT

The spatial and temporal inconsistency of rainfall has increased during the recent decade, particularly in rainfed regions of the country. The rainfed areas face deficit and surplus distribution of rainfall during critical stages of crop growth. Therefore, planning of different agricultural activities consistent with these changes and specific crop is envisaged as key to safe guard against crop failure. In this study, analysis of 36 years (1980-2016) rainfall data using Markov chain model is used to find initial, conditional and consecutive dry and wet week probability and rainfall at different probability levels using incomplete gamma distribution. The forward and backward accumulation of rainfall is used for assessment of onset and withdrawal of rainy season. The weekly water balance for water deficit and surplus is carried using Thornthwaite method and best fit frequency distribution is identified for annual water deficit using chi square test. The average annual rainfall of Mirzapur district is found to be 1022.17 mm with 21.6% coefficient of variation. The onset and withdrawal of rainy season starts effectively from 24th week (11-17 June) and under delayed condition, rainy season starts by 26th week (25 June-01 July). Under normal conditions, the rainy season starts by 25th week (18-24 June). The rainy season ends at earliest by 42th week (18-24 October) and under delayed condition rainy season may end by 50th week (11-16 December). Under normal condition rainy season ends by 46th week (10-16 November).The Gumbel distribution is found suitable for predicting annual water deficit based on Chi-square test.